CLAIMS

WE CLAIM:

1. A gas turbine engine, comprising:

a compressor having an inlet and a compressed air outlet;

a turbine having at least an inlet;

a combustor system including:

a housing having at least a first air inlet in fluid communication with the compressed air outlet, a second air inlet adapted to receive compressed air from a second compressed air source, and an inlet plenum in fluid communication with the first and second air inlets,

a combustor mounted at least partially within the housing, the combustor having one or more air inlets in fluid communication with the housing inlet plenum, and an outlet in fluid communication with the turbine inlet,

a bypass conduit having an inlet, an outlet, and a flow passage therebetween, the bypass conduit inlet in fluid communication with the housing inlet plenum, and the bypass conduit outlet in fluid communication with the combustor outlet, and

a valve mounted on the bypass conduit and moveable between (i) an open position, whereby fluid flow through the bypass conduit is allowed, and (ii) a closed position, whereby fluid flow through the bypass conduit is prevented.

2. The gas turbine engine of Claim 1, further comprising:

an actuator assembly coupled to the valve, the actuator assembly adapted to receive valve position command signals and operable, in response thereto, to move the valve between the open and closed positions.

3. The gas turbine engine of Claim 1, further comprising:

a fuel injector coupled to the housing and configured to inject fuel supplied thereto into the combustor.

4. The gas turbine engine of Claim 3, further comprising:

one or more igniters coupled to the housing and extending at least partially into the combustor.

5. The gas turbine engine of Claim 1, further comprising:

a combustion air conduit coupled between the combustor outlet and the turbine inlet.

6. The gas turbine engine of Claim 5, wherein the combustion air conduit is configured to be substantially spiral in shape.

7. The gas turbine engine of Claim 5, wherein the bypass conduit outlet is in flow communication with the combustion air conduit.

8. The gas turbine engine of Claim 1, further comprising:

a conduit interface coupled to and surrounding the combustor, the conduit interface having an inlet and an outlet, the conduit interface inlet in fluid communication with the bypass conduit outlet, and the conduit interface outlet in fluid communication with the turbine inlet.

9. The gas turbine engine of Claim 8, further comprising:

a combustion air conduit having an inlet and an outlet, the combustion air conduit inlet coupled to, and in fluid communication with, the conduit interface outlet, and the combustion air conduit outlet coupled to, and in fluid communication with, the turbine inlet.

10. A combustor system, comprising:

a housing having at least a first air inlet, a second air inlet, and an inlet plenum in fluid communication with the first and second air inlets, the first air inlet adapted to receive compressed air from a first compressed air source, and the second air inlet adapted to receive compressed air from a second compressed air source;

a combustor mounted at least partially within the housing, the combustor having one or more inlets, and an outlet, each combustor inlet in fluid communication with the housing inlet plenum;

a bypass conduit having an inlet, an outlet, and a flow passage therebetween, the bypass conduit inlet in fluid communication with the housing inlet plenum, and the bypass conduit outlet in fluid communication with the combustor outlet; and

a valve mounted on the bypass conduit and moveable between (i) an open position, whereby fluid flow through the bypass conduit is allowed, and (ii) a closed position, whereby fluid flow through the bypass conduit is prevented.

11. The combustor system of Claim 10, further comprising:

an actuator mounted on the combustor assembly housing and coupled to the valve, the actuator adapted to receive valve position command signals and operable, in response thereto, to move the valve between the open and closed positions.

12 The combustor system of Claim 10, further comprising:

a fuel injector coupled to the housing and having at least a fuel inlet and a fuel outlet in fluid communication with one another, the fuel inlet coupled to receive fuel from a fuel source, and the fuel outlet disposed within the combustor.

13. The combustor system of Claim 12, further comprising:

one or more igniters extending into the combustor.

14. The combustor system of Claim 10, further comprising:

a combustion air conduit coupled between the combustor outlet and the turbine inlet.

15. The combustor system of Claim 14, wherein the combustion air conduit is configured to be substantially spiral in shape.

16. The combustor system of Claim 14, wherein the bypass conduit outlet is in flow communication with the combustion air conduit.

17. The combustor system of Claim 10, further comprising:

a conduit interface coupled to and surrounding the combustor, the conduit interface having an inlet and an outlet, the conduit interface inlet in fluid communication with the bypass conduit outlet, and the conduit interface outlet in fluid communication with the turbine inlet.

18. The combustor system of Claim 17, further comprising:

a combustion air conduit having an inlet and an outlet, the combustion air conduit inlet coupled to, and in fluid communication with, the conduit interface outlet, and the combustion air conduit outlet coupled to, and in fluid communication with, the turbine inlet.

19. A system, comprising:

a main engine including a compressor, a combustor, and one or more turbines; and

an auxiliary power unit (APU) including a compressor having an inlet and a compressed air outlet, a turbine having at least an inlet, and a combustor system, the combustor system including:

a housing having at least a first air inlet in fluid communication with the APU compressor air outlet, a second air inlet coupled to receive compressed air from the main engine compressor, and an inlet plenum in fluid communication with the first and second air inlets,

a combustor mounted at least partially within the combustor system housing, the combustor having one or more air inlets in fluid communication with the housing inlet plenum, and an outlet in fluid communication with the APU turbine inlet,

a bypass conduit having an inlet, an outlet, and a flow passage therebetween, the bypass conduit inlet in fluid communication with the combustor system housing inlet plenum, and the bypass conduit outlet in fluid communication with the combustor outlet, and

a valve mounted on the bypass conduit and moveable between (i) an open position, whereby fluid flow through the bypass conduit is allowed, and (ii) a closed position, whereby fluid flow through the bypass conduit is prevented.

20. A method of operating a gas turbine engine having at least a combustor, the method comprising the steps of:

supplying a flow of compressed air through the combustor;

determining whether the compressed air flowing through the combustor should be ignited;

if so, bypassing a portion of the compressed air flow away from the combustor;

supplying fuel to the combustor; and

igniting the fuel supplied thereto.